

# “On-chip micro/nanorobotic swimmers toward biomedical applications”

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Untethered micro/nanorobotic swimmers are promising tool towards biologic or biomedical applications thanks to their highly accessible feature to tiny capillaries. However great challenges in design, fabrication and low Reynolds number physics have limited such applications. We integrated multidisciplinary technologies of micro/nanofabrication, microfluidics and microrobotics to those challenges. We recently developed highly energy efficient and fully controllable on-chip magnetic micro/nanorobotic swimmers with remote controlled functions such as cargo transport and sensing. A brief introduction to international joint laboratory (LIMMS-CNRS) at The University of Tokyo where I am currently hosted will be given at the beginning of seminar. Then I will introduce our recently developed micro and nanorobotic swimmers which can serve as mobile micromanipulator or physical sensor inside microfluidic channels. The presentation will be concluded by discussing ongoing and future perspectives toward biomedical applications.

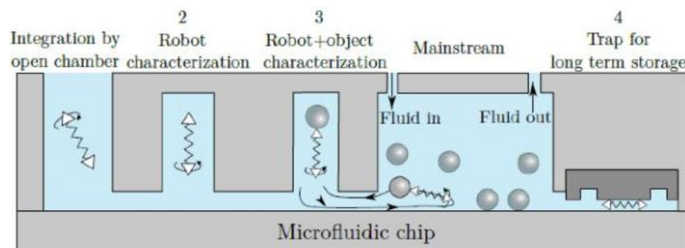


Figure On-chip integrated micro/nanorobotic swimmer for physical sensing and manipulation inside microfluidics towards biomedical applications.



Gilgueng Hwang obtained M.Sc. and Ph.D of Electrical Engineering from The University of Tokyo. After spending 2 years at ETHZ, Zurich, Switzerland and 2 years of postdoc at Sorbonne University, he joined to LPN (currently C2N) as CNRS researcher in October 2010. He obtained physics HDR degree in 2018. He is currently with the LIMMS-CNRS in the University of Tokyo, Japan. He has been awarded 5 world champions in the IEEE International Mobile Microrobotics Challenges.

**Link :** <https://zoom.us/j/94322769401>

